



**ISO 10303-232: Technical Data Packaging
Core Information and Exchange**
Greg A. Paul, P.E.



What is PAS-C?



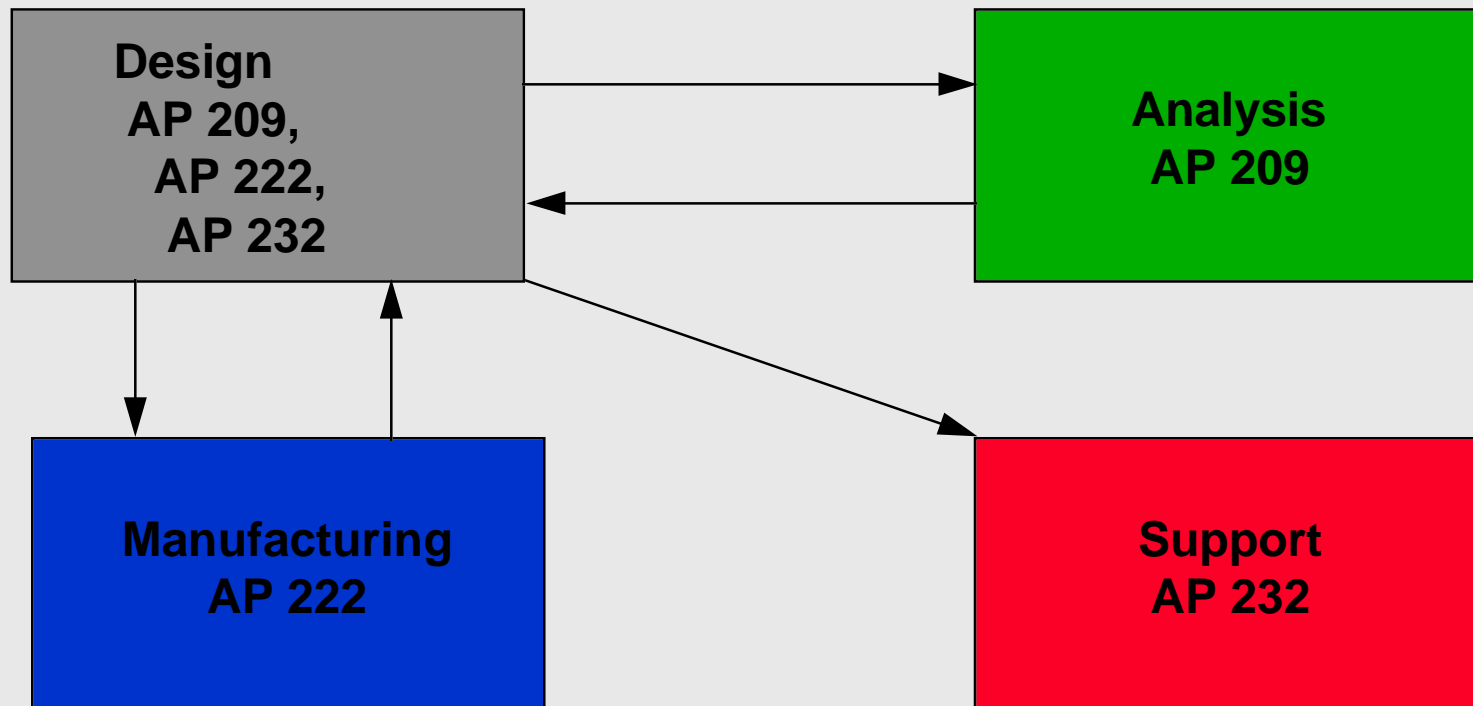
PAS-C: PDES Application Protocol Suite for Composites

- **Contract: Wright Patterson AFB**
- **Duration: July 1991 - March 1997**
- **Status: 3 Months left**
- **Value: \$5.4 million**

PAS-C Objective



- **Reduce cost of composite parts**
 - Reduce interpretation/communication time
 - » Standardize product data





AP 232: Technical Data Packaging Core Information and Exchange



Product Data Group Packaging

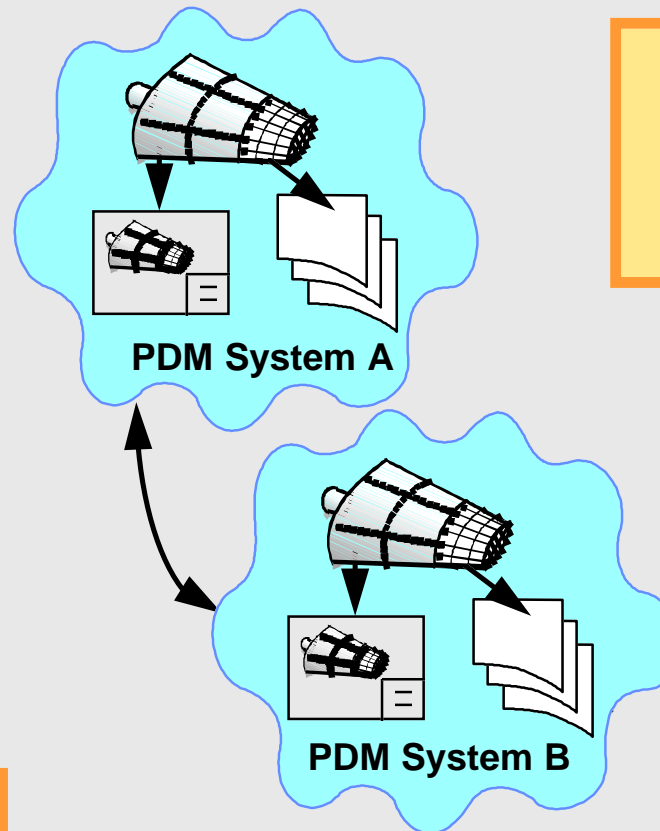
- Product Structure Based
- Product/Document Relationships
- Exchange Configuration Parameters
- Ties all Forms of Product Data together (Both STEP and Non-STEP data)

Product Data Groups (Non-STEP)

- Drawings
- CAD Models
- Associated Lists
- Reference Documents
- Analysis Files
- NC Program

Product Data Groups (STEP)

- AP 232
- AP 209
- AP 203
- AP XXX



PDM System A

PDM System B

Document Configuration

- Versioning
- Representation Forms
- Identification of Content File(s)
- Configuration Parameters

Associated Lists

- Parts List
- Data List
- Index List
- Indentured Data List
- Other Lists
- Presentation

Product Data Sets (Shape)

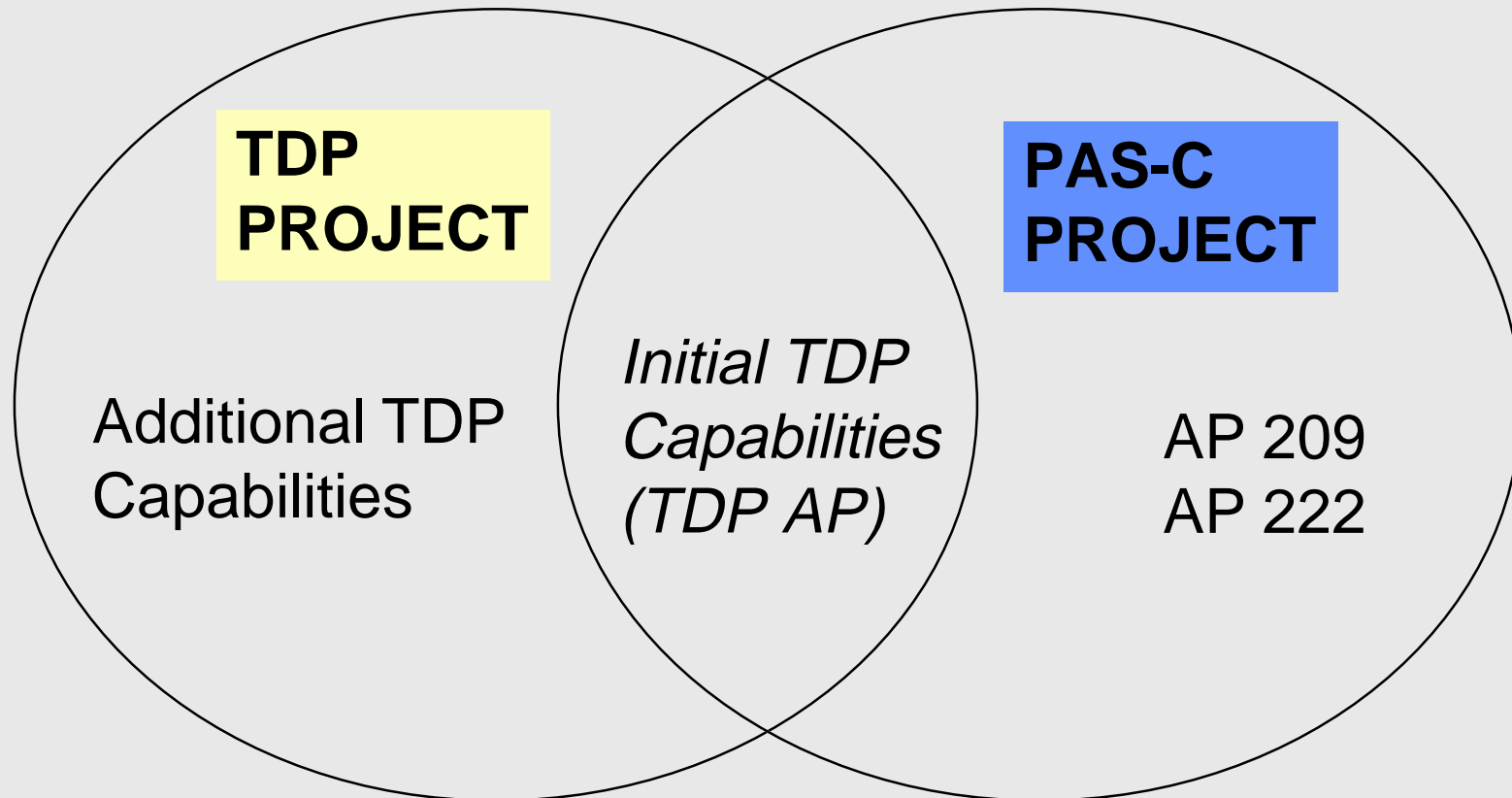
- Advanced B-Representation
- Facetted B-Representation
- Manifold Surfaces with Topology
- Wireframe and Surface without Topology
- Wireframe Geometry with Topology

Exchange Parameters

- Reason
- Destination
- Identification of Associated Business Documents



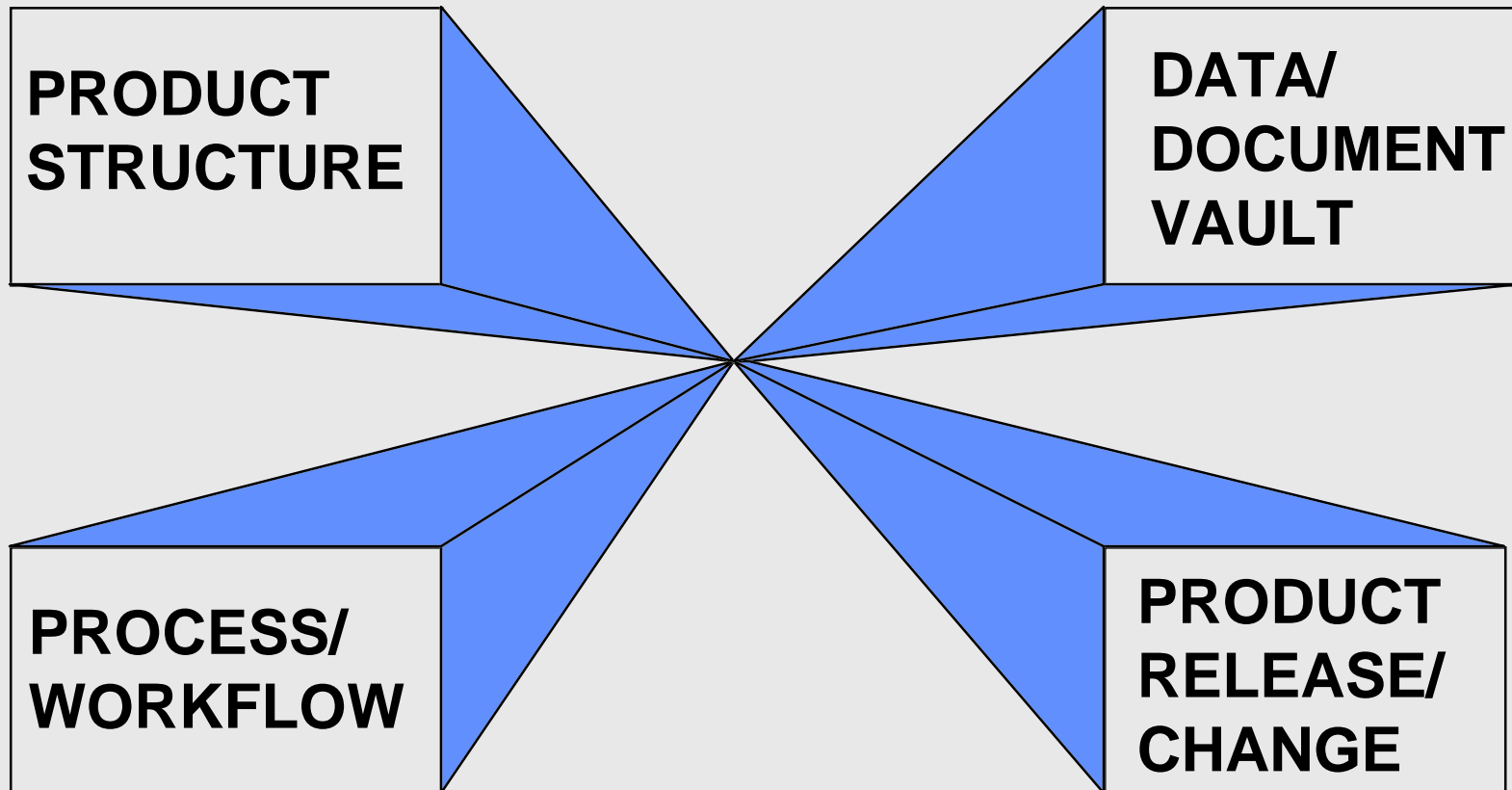
Technical Data Package (TDP) Project Relationships



TDP Project -- NIST/CALS
PAS-C Project -- USAF ManTech
PDES, Inc.



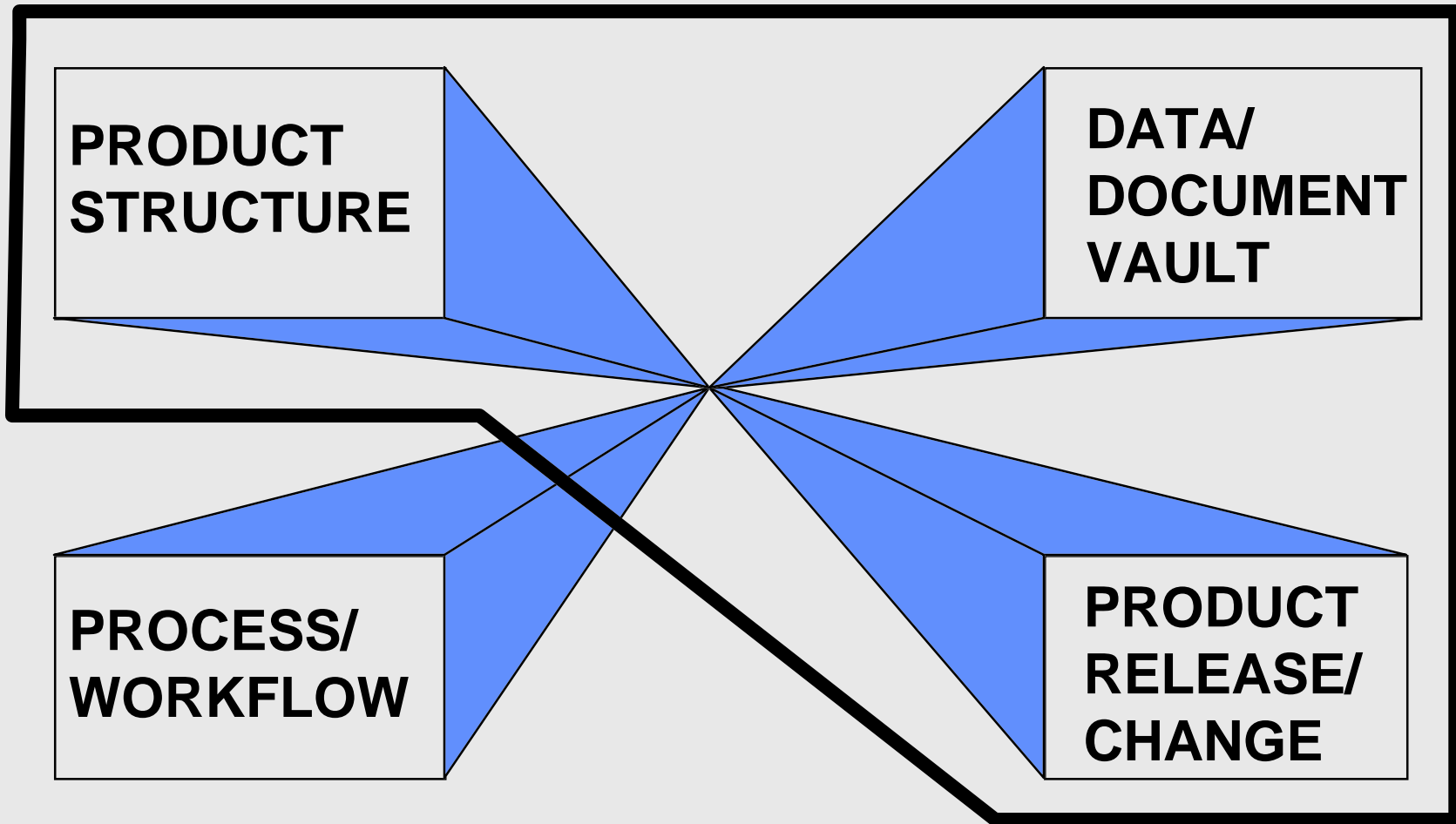
Product Data Manager (PDM) Functions





PDM Information Area

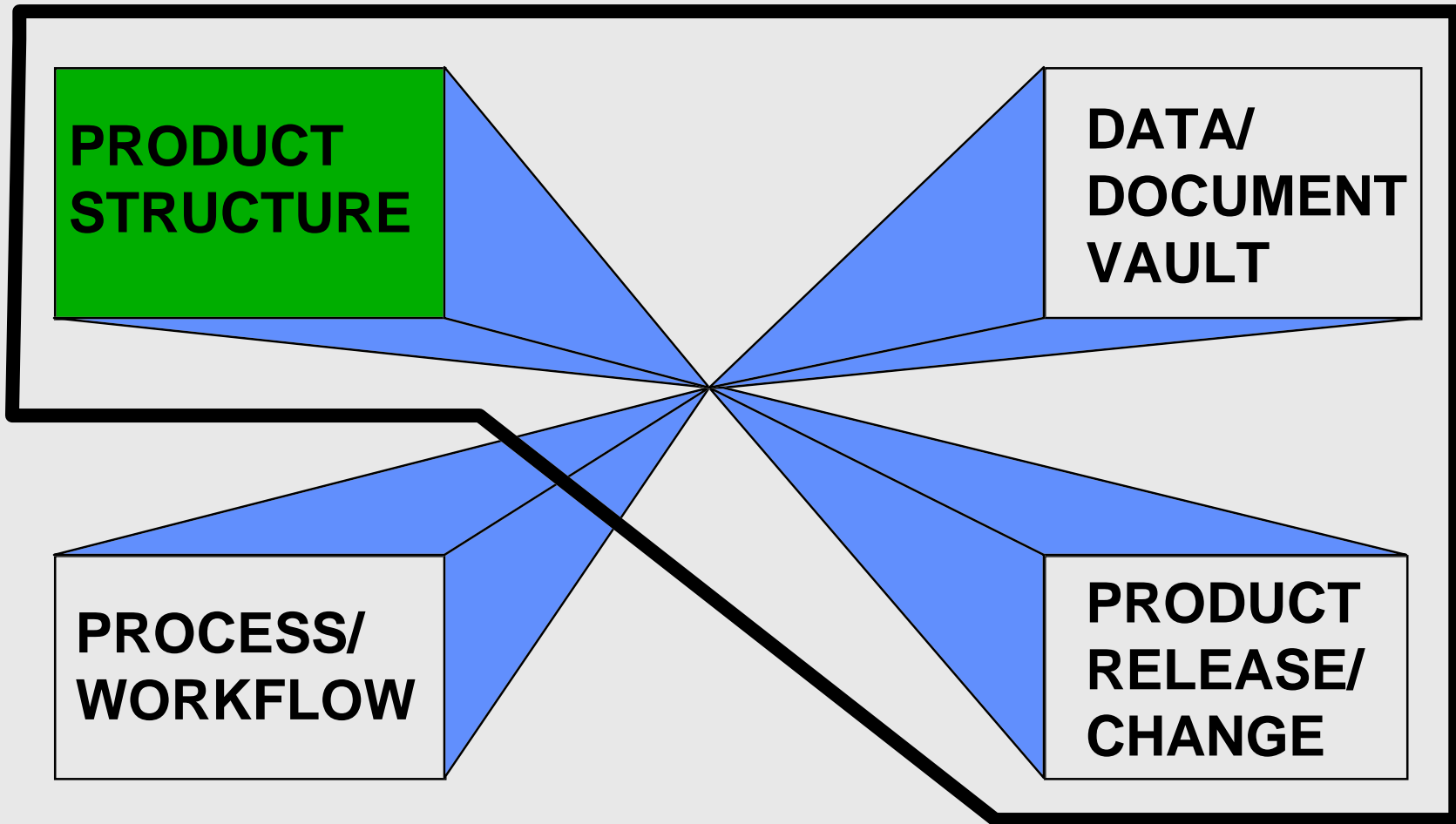
AP 232 Addresses





PDM Information Area

AP 232 Addresses





Product Structure Example in a PDM system



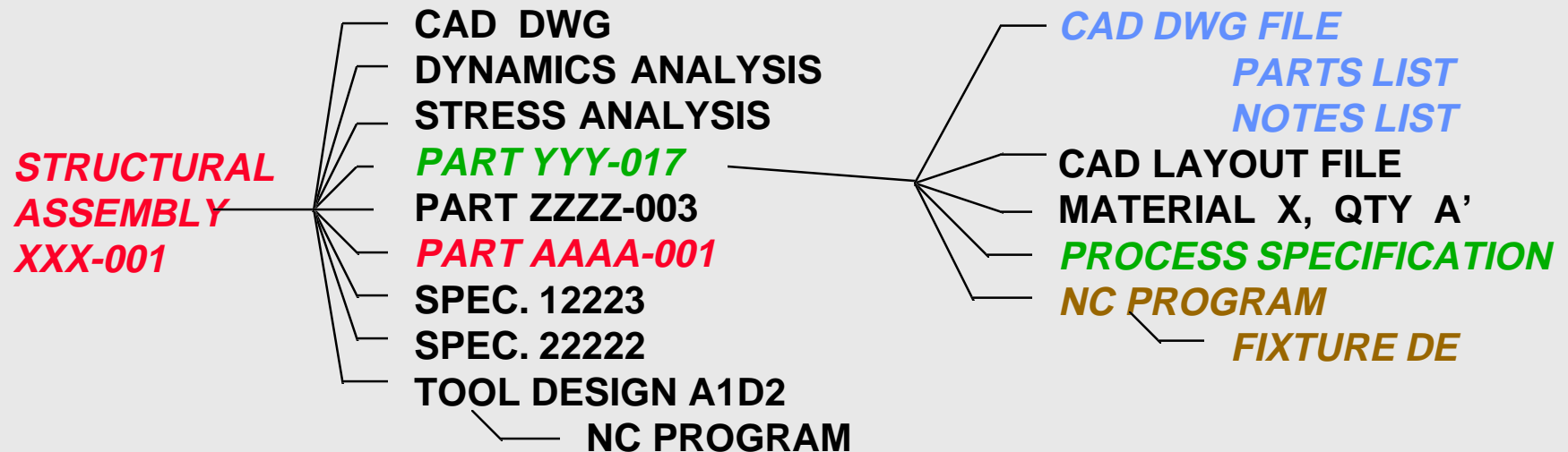
Types of Relationships:

Part to Part

Part to Document

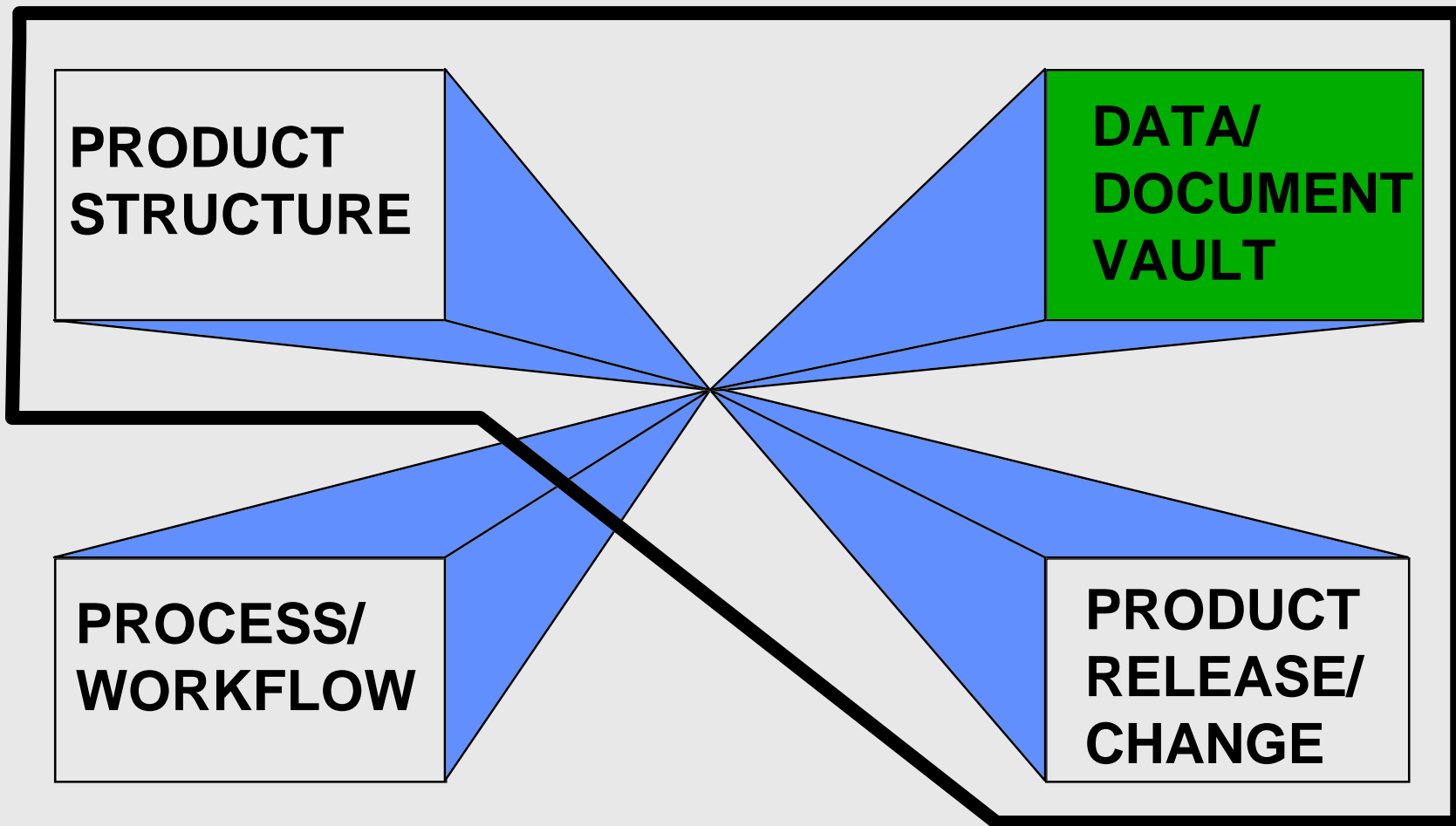
Document to Document

Document to Part





PDM Information Area AP 232 Addresses





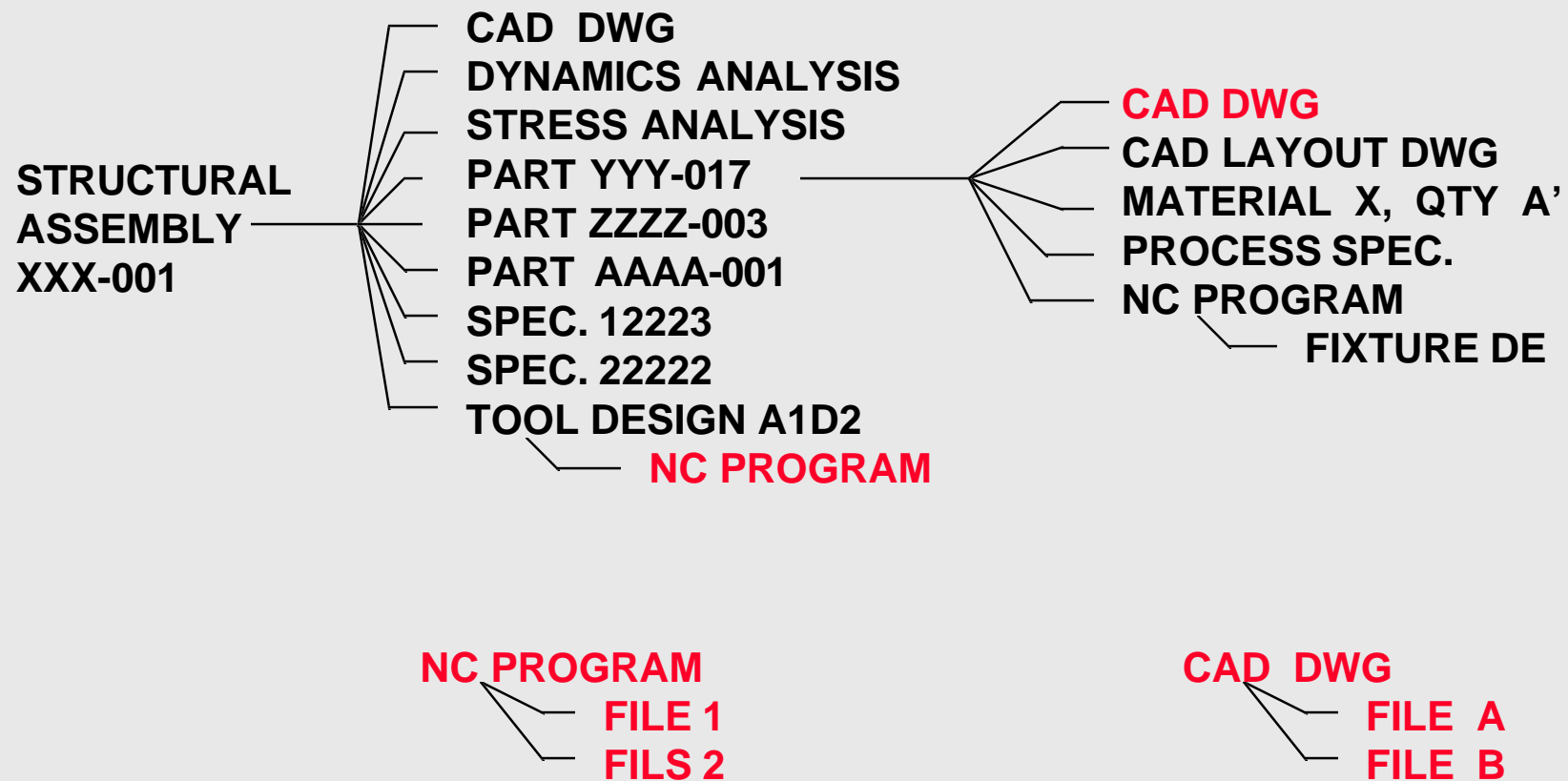
Document



- **A document may be a group of product data**
 - about one or more products
 - that supports one or more applications
 - not just paper
- **A document can reside in:**
 - various formats (e.g., Raster, SGML, Word, IGES, STEP)
 - one electronic file or across multiple electronic files
 - a view within a product structure.

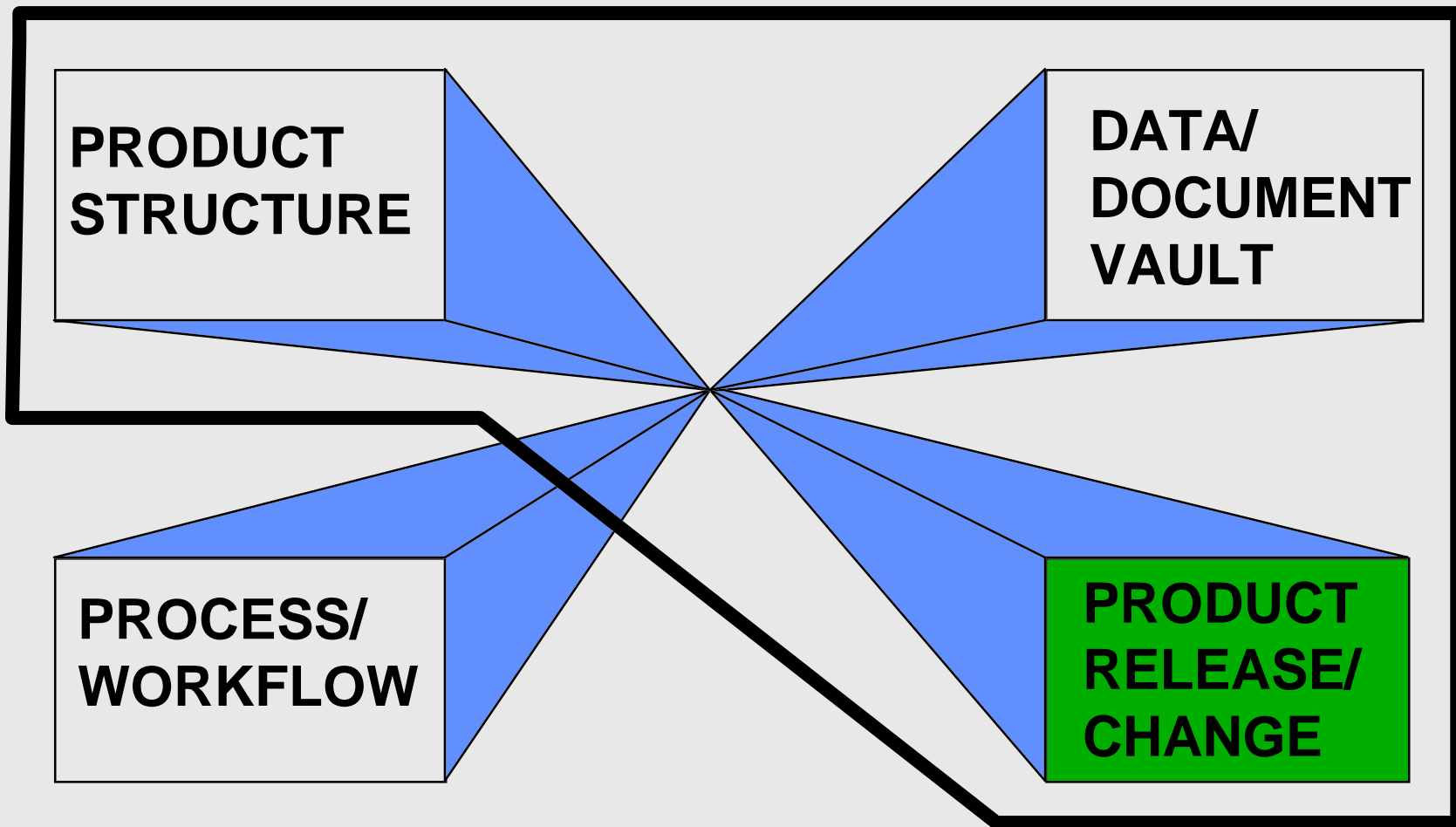


Document / Data Relationships





PDM Information Area AP 232 Addresses

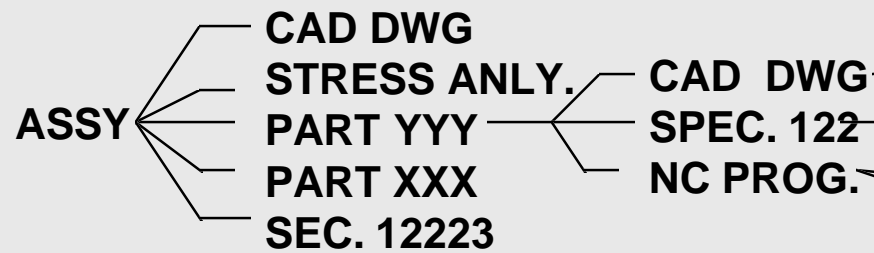




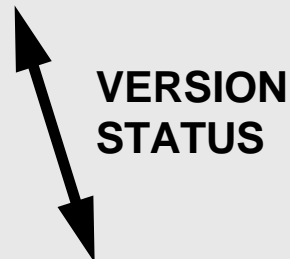
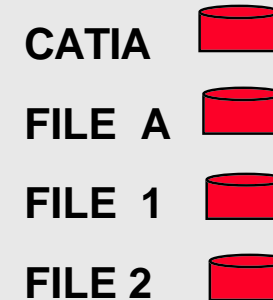
PDM Data and Access



PRODUCT STRUCTURE



DOCUMENT / DATA



RELEASE / CHANGE AUTHORIZATION

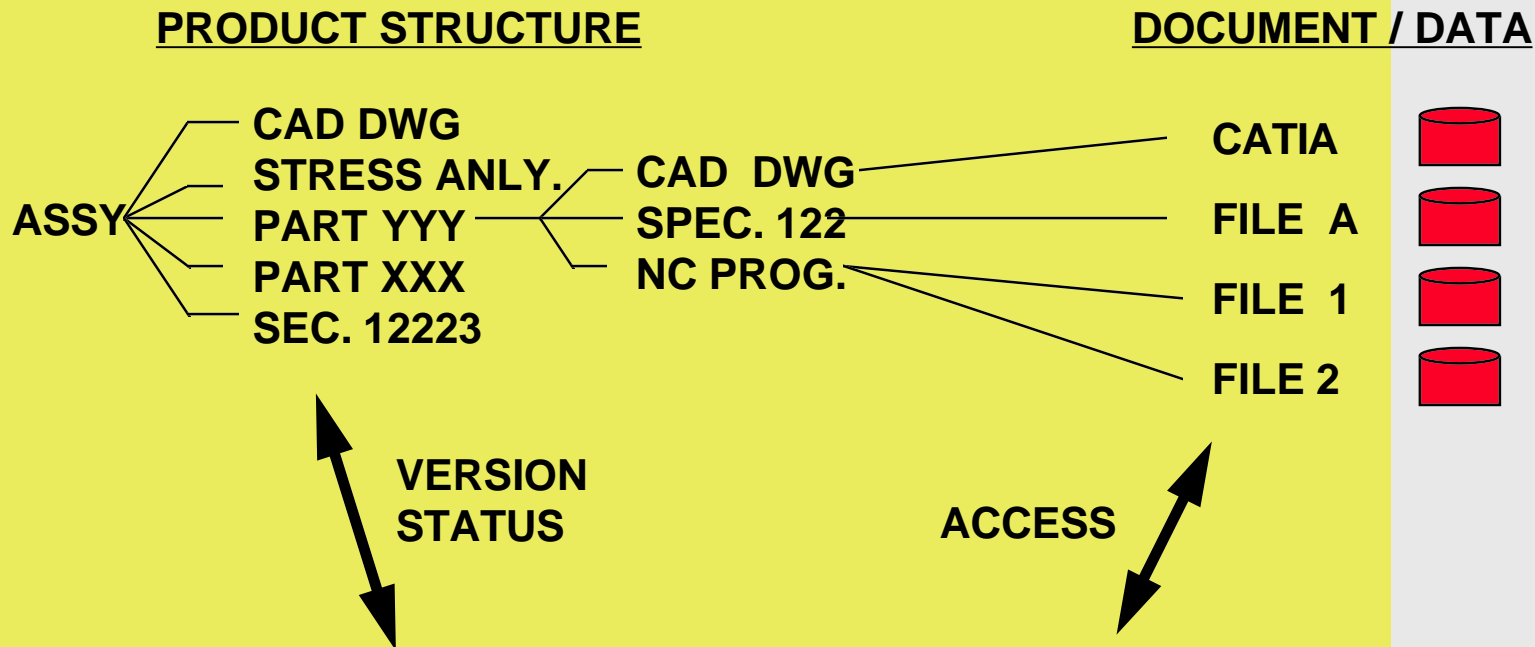


PDM Data and Access

(Data Definition Exchange Overlay)

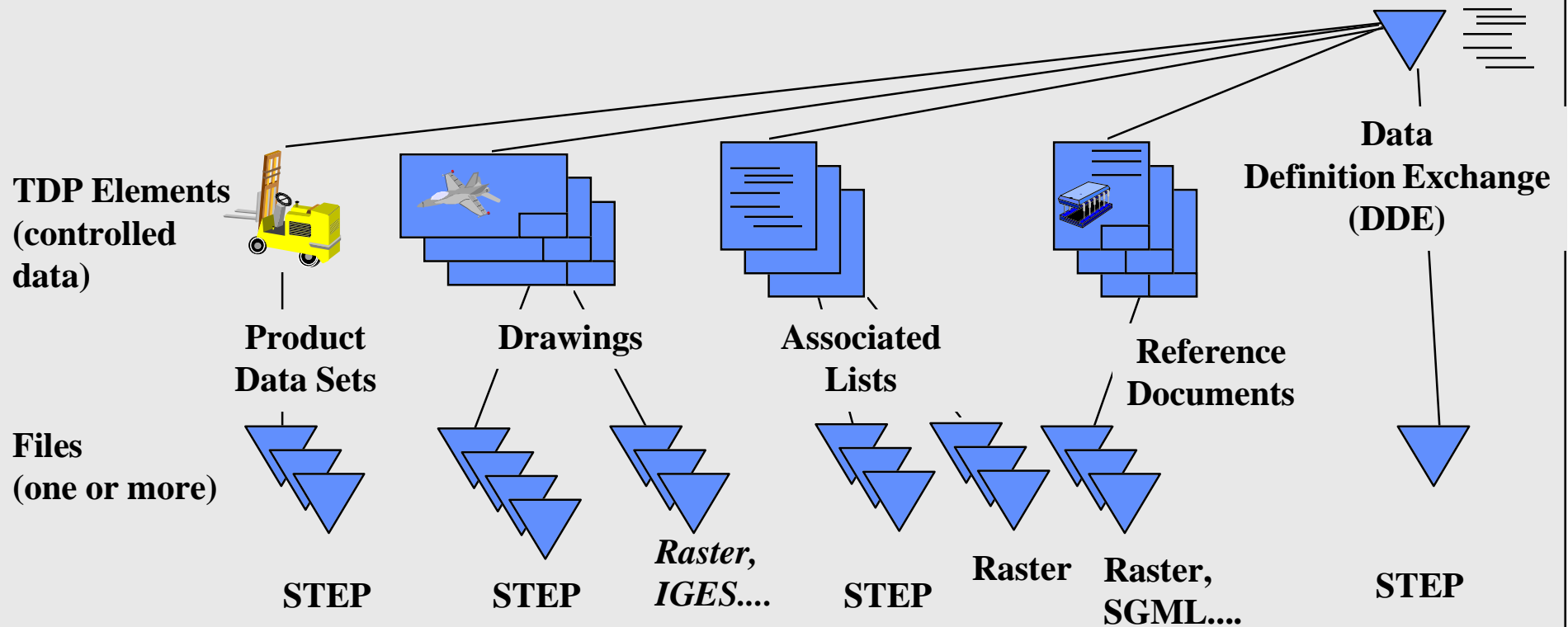


DATA DEFINITION EXCHANGE (DDE)



RELEASE / CHANGE AUTHORIZATION

AP 232 Elements





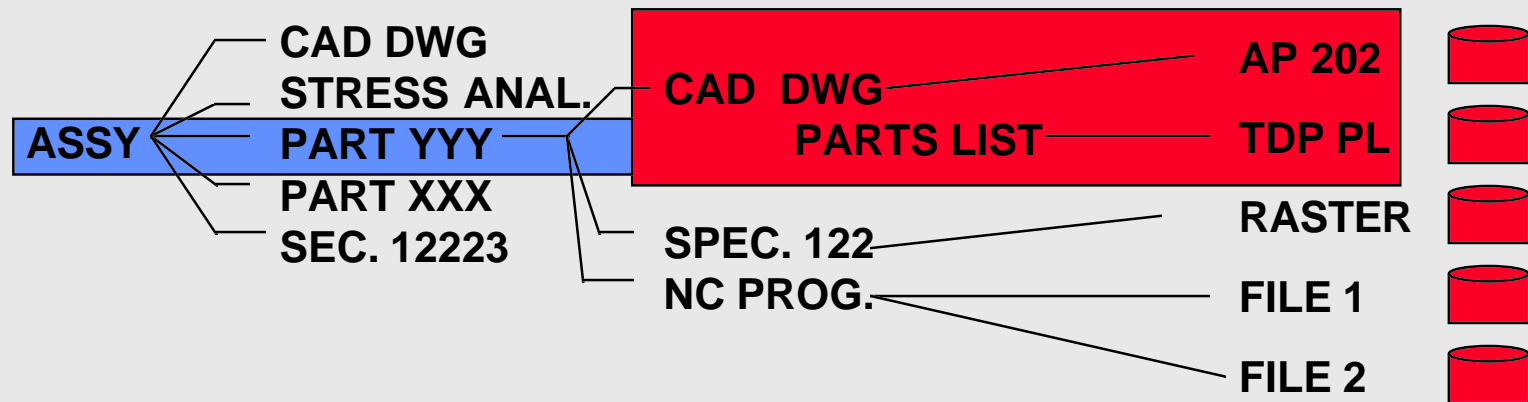
PDM Data

How a DDE is Used



PRODUCT STRUCTURE

DOCUMENT / DATA



DESCRIBES DATA NEEDED TO SATISFY THE BUSINESS PURPOSE FOR THE EXCHANGE

■ DESCRIBES THE DATA THAT IS BEING TRANSMITTED

■ DESCRIBES THE BUSINESS CONTEXT OF THE EXCHANGE
PURPOSE, PRODUCT/ITEM FOCUS....



Sample Data Definition Exchange (DDE)



Document #	Creator CO. Code	Title	REV	Issue Date	Delivery Accounting Ref
DDE-1	94444	DDE for Composite Bond Assembly Skin, Horizontal Stabilizer	A	2/14/96	

Exchange Reason: Revision Update Data Submittal	Destination CO. Code:	Security Classification:	
	80378	Unclassified	

IND LEV	ITEM/ DOC ID	TITLE	REV LEVEL	CO. CODE	NO. of SHEETS	FILE ID	SIZE	TYPE	INCL
0	ABD-001	Horizontal Assy		80378					N
1	ABD	Box Assy Dwg	B	80378	3	DRABD	4.0mb	RASTER	N
1	STR-AD1	Stress Anly. FEA		80378		STRAD1	2.3mb	AP 209	N
1	DP1-YYY	Skin Panel	C	94444					N
2	DP1	Bond Assy Dwg	C	94444	6	DRDP1	1.9mb	AP 202	Y
3	PL-DP1	Parts List	D	94444	4	PLDP1	1.0mb	TDP PL	Y
2	SPEC-112	Process Spec.	1	94444	8	SP322	0.8mb	SGML	N
2	NCP-1	APT Program	D	94444		NCP11	0.3mb	ASCII	N
						NCP12	0.5mb	ASCII	N
1	DP2-XXX	Web Stiffener	A	80378					N
1	SPEC-12223	Process Spec.	0	80378	15				N



Associated Lists



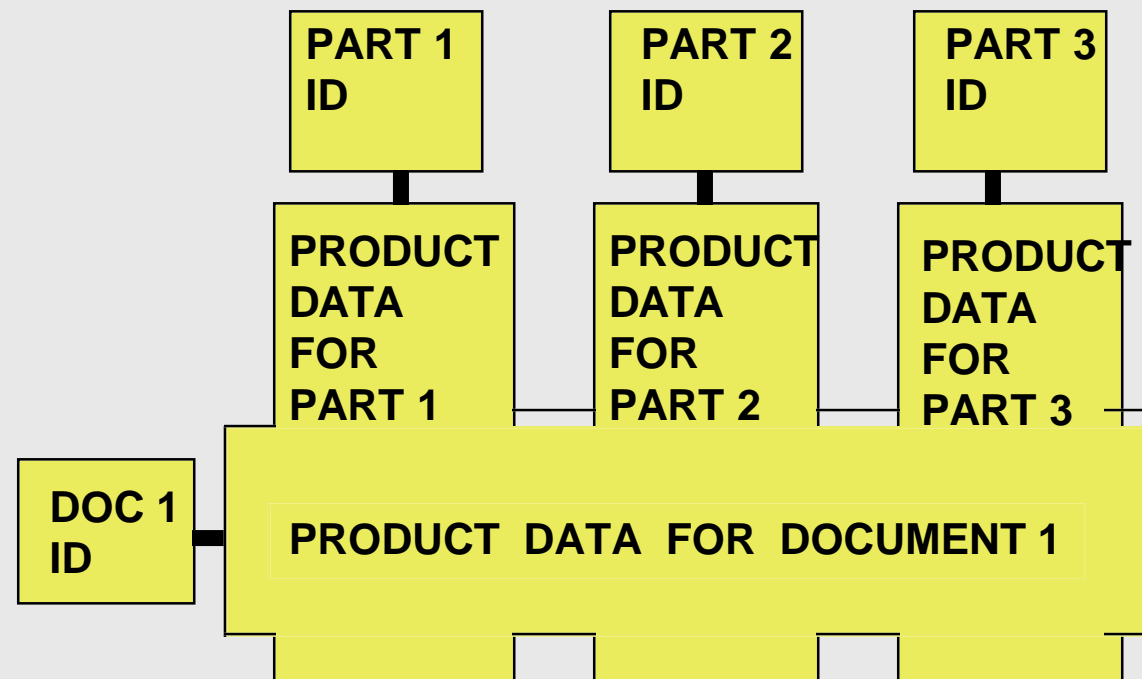
- **Computer processable Associated Lists**
 - Parts List,
 - Indentured Data List,
 - Data List,
 - Index List



Migration Strategy



- Utilize common Information Structure for both document and part view of product information





PDM Data Parts List in AP 232 Format



PRODUCT STRUCTURE

ASSY {
 CAD DWG
 STRESS ANAL.
 PART YYY
 PART XXX
 SEC. 12223

CAD DWG

SPEC. 122

NC PROG.

DOCUMENT / DATA

AP 202

PARTS LIST

TDP PL

RASTER

FILE 1

FILE 2





AP 232

Uses/Benefits



- Represent both commercial and government requirements for the information and functionality of associated lists
- Provide an expedient migration path into STEP for enterprises and industries that have large infrastructures that rely on document based management systems
- Accommodate both a product item based and a document based configuration identification capability of the same product technical data



AP 232

Uses/Benefits (Cont.)



- **Improve data retention/archival processes**
 - Captures the relationships between the product structure and the document structure
 - Can store product information from a document based view and be able to use the information from a product item perspective
- **Allow technical data which is computer interpretable to be exchanged**
 - Standardizes computer processable associated list information (e.g., Parts Lists, Notes Lists, Data Lists)
- **Enable effective automation of business processes associated with product data**



Summary



- **Standard represents Gvt and Industry reqmts**
- **Standard is basis for:**
 - Technical Data Package (TDP) exchange
 - PDM System implementation
 - Document or part view of product information
- **Standard is progressing through ISO process**
 - Extends current STEP capabilities
 - Agreement from X countries to work on effort
 - Reference Model has had extensive review by US and International (government and industry) personnel



Additional Information



- **Digital Copy - Gordon Ney or Greg A. Paul**
 - WordPerfect 6.1 Format
 - Requires ZIP utility for extract
- **Paper Copy - Greg A. Paul**
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